State of California
Department of Industrial Relations

Memorandum

To: Marley Hart, Executive Officer
Occupational Safety and Health Standards Board
2520 Venture Oaks Way, Suite 350
Sacramento, CA 95833

Date: April 10, 2012

From: Ellen Widess, Chief
Division of Occupational Safety and Health

Subject: Division Evaluation of Petition 528
Andras Uhlyarik, California Pulse, Inc.

This memorandum is written in response to the petition received by the Occupational Safety and Health Standards Board (Board) on February 14, 2012 from Mr. Andras Uhlyarik (Petitioner) with California Pulse Inc., to adopt NFPA 33, 2011 edition Section 7.5 into Title 8 with regard to recirculating spray booth exhaust. This NFPA Section specifies conditions that would allow for the recirculation of contaminated exhaust air from a spray booth to be recirculated into the booth for manned and unmanned operations. The impact of the proposal would be to require modifications to Title 8 Sections which currently prohibit, directly or indirectly, the recirculation of contaminated exhaust air back into an operating spray booth. The stated basis for this proposal is that the relevant Title 8 Sections no longer incorporate the current NFPA 33 requirements in Section 7.5. The proposed modification provides no alternative or increased protection for the exposed employees but states that the modification would establish the acceptable method of recirculating spray booth air.

Labor Code Section 142.2 permits interested persons to propose new or revised standards concerning occupational safety and health, and requires the Board to consider such proposals, and render a decision no later than six months following receipt. Further, as required by Labor Code Section 147, any proposed occupational safety or health standard received by the Board from a source other than the Division must be referred to the Division for evaluation, and the Division has 60 days after receipt to submit a report on the proposal.

The Division has prepared this memorandum as an evaluation of the petition.

Actions Requested by the Petitioner

The petitioner proposes to incorporate NFPA 33, 2011, section 7.5 into Title 8 to clarify the acceptable method of recirculating spray booth air.

Existing Title 8 Regulations

Section 5153, subsection (c)(1) which prohibits recirculation of exhaust air into a spray booth:
(c) Exhaust and Make-Up Air. (1) Air exhausted from spray operations shall not be recirculated. Safe arrangements should be provided for an adequate supply of make-up air to compensate for air exhausted from spraying operations.
Section 5141 subsection (c) Control by Respiratory Protective Equipment. Respiratory protective equipment, in accordance with Section 5144, shall be used to prevent harmful exposures as follows:
(1) During the time period necessary to install or implement feasible engineering controls;

(2) Where feasible engineering controls and administrative controls fail to achieve full compliance; and
(3) In emergencies.

In Article 137 Spray Coating Operations, Section 5450 Ventilation subsection (b):
(b) Except as permitted in Section 5460, each spray booth shall have an independent exhaust duct system discharging to the building exterior. Multiple cabinet spray booths in which identical spray finishing material is used with a combined frontal area of more than eighteen square feet shall not have a common exhaust.

OSHA Regulations

The U.S. Department of Labor Occupational Safety and Health Administration (OSHA) has a specific regulation, CFR 1910.107 Spray finishing using flammable and combustible materials, that is structured like the NFPA 33 guideline and contains most of the requirements corresponding to various title 8 Sections. With regard to the specific modification informally requested by the petitioner, Subsection (d)(9) applies to the control of contaminated exhaust air and reads:
"*Air exhaust.* Air exhaust from spray operations shall not be directed so that it will contaminate makeup air being introduced into the spraying area or other ventilating intakes, nor directed so as to create a nuisance. Air exhausted from spray operations shall not be recirculated."

Letter of Interpretation

OSHA letter of interpretation dated September 17, 2001 to Robert Trinkl of Harley Davidson Motor Company discusses spray booth recirculation of exhausted air, and the conditions under which OSHA could consider recirculation of contaminated spray booth air as *de minimis*.

Guidelines

National Fire Protection Association's, NFPA 33 Section 7.5, 2011 Edition
NFPA 33 Section 7.5 Recirculation of Exhaust has two subsections, one for unmanned operations, and the other for occupied spaces. Subsection 7.5.1 establishes 6 conditions for recirculation. Subsection 7.5.2 states that subsection 7.5.1 shall not disallow recirculation of air to occupied spaces, but specifically cites the requirements of ANSI/AIHA Z9.7 American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems as being the applicable standard to be met.

ANSI/AIHA Z9.7 American National Standard for the Recirculation of Air from Industrial Process Exhaust Systems 2007.
The 2007 is the most recent version of this consensus standard. Subsection 4.2.1 Material Requiring Special Precautions has two stringent requirements for recirculating exhaust air. The first states:
"Those agents that do not have a suitable, effective air cleaning method capable of removing sufficient contaminant to achieve airborne concentration as low as 10% of the acceptable level shall not be recirculated."
They define acceptable level as Permissible Exposure Limits (PEL) or Threshold Limit Values (TLV) in the absence of a PEL. Then for the materials that have suitable air cleaning methodology, a Continuous Monitoring Device (CMD) and failure condition are specified, and the standard says in part:
"...shall not be recirculated unless the following provisions are met:

- There is a functioning CMD in the exhaust air stream capable of detecting at least as low as 10% the acceptable level in the discharge ductwork
- Air cleaning device failure will not result in an employee exposure above the acceptable level."

Discussion

Modification of Section 5153 to incorporate ANSI Z9.7

The petitioner's request to incorporate the 2011 version of NFPA 33 would require section 5153(c)(1) to be revised because NFPA 33, has been changed since the 1969 Edition that was the reference for Section 5153(c)(1). The 2011 Edition now allows air exhausted from a spray booth to be recirculated if the recirculated air meets the criteria in the American National Standards Institute (ANSI) Standard Z9.7 2007. The ANSI Z9.7 basically requires all particulates to be removed from the contaminated air, and any toxic contaminants removed from the air stream to achieve concentrations no higher than 10% of the current Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) concentrations. ANSI Z9.7 also requires that the recirculated air is monitored by a continuous monitoring device that either directly measures the airborne concentrations in the air being recirculated or the performance of the apparatus that is removing the toxic materials from the exhaust air, such as a thermal oxidizing system. Adopting ANSI Z9.7 requirements into section 5153 to provide adequate guidance would require modifying the section to address the array of spray coating substances and establishing performance parameters and acceptable direct reading methods for all the materials that could be used in spray coating booths. For many potential components of spray coating materials, there are no direct reading instruments that could usefully monitor the return airstream in accordance with ANSI Z9.7 or economically useful air cleaning systems. Thus the proposed modification would be very difficult to safely utilize.

Compliance with section 5141

The intentional recirculation of contaminated exhaust air back into a spray booth inherently contradicts the fundamental principles of occupational health and safety, the "hierarchy of controls", that are incorporated into section 5141 which requires the elimination of harmful exposures using engineering controls, then administrative controls, and finally personal protective equipment when there is no feasible engineering or administrative control. The proposed modification involves the use of engineering controls that increase employee exposure.

Equivalency with OSHA standards

Section 5153 is currently at least as effective as OSHA's existing regulation, CFR 1910.107. OSHA also has issued a letter of interpretation on the issue dated September 17, 2001 from Richard Fairfax to Robert Trinkl. The 2001 letter discusses conditions involving recirculation into unmanned spray booths that would constitute the OSHA "de minimis" violation of section 1910.107. The 2001letter states that recirculation of air that has been cleaned would have to meet NFPA 33 and ANSI Z9.7 criteria, and would be a de minimis violation only "when the employer's action provides equal or greater employee protection". The petition does not provide any information about methods or technologies for cleaning the exhaust air or using additional protective measures to meet and exceed the criteria of ANSI Z9.7. The petition provides no information regarding enhanced protections for the employee as the basis for the modification, or how these conditions would be achieved by employers. Consequently, the modification to Section 5153 based only on the criteria of ANSI Z9.7 and NFPA 33, would render 5153 less protective than CFR 1910.107and therefore not considered as effective as the OSHA regulation.

Existing variances related to the proposed modification

Finally, the petition seeks a modification that would inform employers as to what conditions would establish acceptable criteria for recirculating contaminated spray booth exhaust, presumably to meet ANSI Z9.7, and

assuming that the modification could meet Federal equivalency. The difficulty in making such a modification is demonstrated by the Division's experience with an experimental variance issued in 2004, to a manufacturer of motor homes. The company had installed a spray booth with recirculating ventilation to reduce the cost of cleaning the exhausted air to meet local air pollution requirements. The employer believed that the booth as constructed met the requirements of ANSI Z9.7 and was compliant with the OSHA letter of interpretation referenced above. One of the components of the sprayed coatings consisted of various concentrations and forms of isocyanates which can easily sensitize exposed workers rendering them unable to breathe isocyanates without severe respiratory system reactions. Although the ventilation system had an air filtration device, the system's air cleaning method was not proven to remove isocyanates and did not have a continuous monitoring device capable of measuring the isocyanates at 10% of the PEL. The employer asserted that the filters installed would remove the isocyanates and that employees would be protected by the use of full face air supplied respirators (which under Title 8 are required for that type of spray painting, and thus not an additional form of protection). The employer hired an industrial hygienist consultant to conduct extensive monitoring and oversight of the operation of the booth. The data produced did not show conformance to conditions of the variance or ANSI Z9.7; some employee exposures as measured outside of the respirator exceeded the PEL for the isocyanate HDI; the short term exposure limit to HDI monomer; 8 hour time-weighted average exposures to total reactive isocyanate groups (TRIG)' and short-term exposure limits to the organic solvents.

The employer also had difficulties in adhering to their own proposed variance conditions. During an unannounced inspection, the Division identified violations of Section 5144 for the use of the respirators, and for failing to train the employees about the conditions of the variance. However the most significant consequence was that at least two of the painters were identified as having become sensitized to isocyanates. The employer claimed but did not prove that this was due to exposures preceding their employment with the company. This experience clearly shows the difficulties inherent in attempting to comply with the conditions of ANSI Z9.7. The Division believes that given the example of a fully resourced employer directly under the oversight of the Division failing to successfully implement the conditions, incorporating ANSI Z9.7 into Section 5153 to permit recirculation of the exhaust air would not provide a useful or safe modification. This also demonstrates the difficulty in modifying sections 5153 and 5450 in terms that would enable an employer to successfully comply with the guidelines and the modified sections, and would be very difficult to enforce.

Conclusion

As discussed above, the proposed modification to Title 8 is problematic for several reasons. First, the proposal lacks any increased or alternative protective measures that would counter the harmful effects of increasing the concentration of contaminants in the spray booth. There is no specific rationale except that NFPA 33 section 7.5 lists conditions for recirculating contaminated air. Secondly, adopting NFPA 33 section 7.5 would render section 5153 less effective than the Federal standard. Finally there would be an inherent difficulty in incorporating the proposed change in a manner that provides clear guidance to employers and enforceable requirements for the Division; the regulation would have to identify acceptable control parameters for every type of flammable spray coating, in any concentration, for any duration. Consequently the Division believes that this petition should be denied.

cc: Robert Nakamura
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